

Education-Related Gender Differences in Health in Rural China

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We investigated gender differences in education-related health inequalities in rural China. Household interview data were obtained from 6 provinces in 1993 and 2001. Remarkable health inequalities existed and favored the higher educational groups; among women, the inequalities were greater and health inequalities increased from 1993 to 2001. Education serves as a more powerful mediating factor for health inequalities among women than among men in rural China. (*Am J Public Health*. 2004;94:1713–1716)

The body of literature on health inequalities has increased steadily.^{1–6} Yet, insufficient attention has been paid to the gender differences; few studies have used morbidity data or conducted time trend analysis.^{7–9} Most of those studies were implemented in industrialized countries,^{10,11} whose health status and other socioeconomic conditions are very different from those in developing countries. For example, the traditional social roles for and discrimination against women still persist in developing countries.

Over the past several decades, China has significantly improved the education of its people. From 1990 to 2000, the illiteracy rate decreased from 15.88% to 6.72%.¹² Meanwhile, China's overall health status has improved. For example, the infant mortality rate decreased from 50.2‰ in 1990 to 32.2‰ in 2000.¹³ However, less well known are the situations pertaining to health inequalities in China. Although the general social status of Chinese women has improved over the years,¹⁴ little is known about the role of gender in health inequalities, especially among rural populations.

To help fill gaps in the literature, we examined gender differences in education-related health inequalities and the time trend among Chinese rural residents and studied the role of education as a mediating factor for health inequalities.

METHODS

Data

The data were from 2 household interview surveys by the Chinese Ministry of Health in 1993¹⁵ and in 2001.¹⁶ Both surveys used a similar multistage stratified sampling framework and the same set of questions, with a response rate of more than 93%.

Representative samples in rural areas were studied from 3 northern provinces (Hebei, Shanxi, and Gansu) and 3 southern provinces (Hubei, Zhejiang, and Guangdong). The major demographic and social characteristics of samples from the same province were comparable across 1993 and 2001. In 1993, 10 662 respondents and in 2001, 9196 respondents aged 15 years and older were included in the current study.

Variables

Individuals were ranked by their educational levels: “basic” is equivalent to less than 5 years of education; “secondary” is equivalent to 5 years; “third” is equivalent to an average of 6 to 9 years; and “highest” is equivalent to an average of 9 years or more.

Other major socioeconomic variables were defined. Current occupational status was classified in 5 groups: farmers, nonagricultural workers, housekeepers, the unemployed, and others. The income criterion was based on per capita household income and divided into quintiles.

Health status was measured by the 6-month rate of chronic diseases. Because chronic illnesses may be related to lifestyle and health care access, we also analyzed the effect of education-related differences in lifestyles (e.g., smoking rate) on education-related health equalities and health care access as reflected by foregone hospitalization.

Associational Analysis

We age-standardized 2 samples from 1993 and 2001 with China's 1990 census data.

The association between educational level and health outcome was assessed with logistic regression models, which controlled for income quintile, occupational status, and age. The adjusted odds ratio reflected the effect of education on health outcome.

We used the Relative Inequality Index, which is based on logistic regression, as the measure of health inequalities.^{17,18} Relative changes between 1993 and 2001 were measured by fitting logistic regression models that combined both surveys.¹⁹ In addition to age and socioeconomic variables, interaction terms of educational levels and the year of the survey were included in the models so that the odds ratio could indicate relative changes between years.

RESULTS

Results of health status by educational level are presented in Table 1. People with lower educational levels clearly had a greater disposition for illness. Results of the Relative Inequality Index indicated that health inequalities among women were greater, and gender differences increased in 2001. Relative changes suggested that the health dissimilarity between bottom and top educational level increased for women from 1993 to 2001.

Table 2 presents differences in lifestyles and health care use by educational level. The rate of unhealthy lifestyle, such as smoking and drinking, decreased with educational attainment. Similarly, the foregone hospitalization rate was lower in higher education groups with healthy lifestyles. In general, differences in health-related behaviors between top and bottom educational level were more significant among women in 2001 than in 1993.

DISCUSSION

One of the major findings from this study is that education-related health inequalities are greater among women than among men in rural China. Existing literature provides very few conclusive inferences on this issue.^{20–22} Generally, gender differences in health inequalities may be explained by the differences between women and men in work conditions, income, lifestyles, and use of health

TABLE 1—The 6-Month Rate of Chronic Diseases, by Educational Level: Rural Areas of China, 1993 and 2001

	Men					Women				
	1993		2001		Relative Change 2001/1993 (95% CI)	1993		2001		Relative Change 2001/1993 (95% CI)
	% ^a	OR ^b (95% CI)	% ^a	OR ^b (95% CI)		% ^a	OR ^b (95% CI)	% ^a	OR ^b (95% CI)	
North										
Educational level	14.92		11.93			16.48		14.97		
Basic ^c	20.41	1.00	17.89	1.00		22.83	1.00	21.61	1.00	
Secondary ^d	14.28	0.78 (0.59, 1.05)	13.23	1.17 (0.81, 1.70)	1.44 (0.92, 2.27)	13.36	0.58 (0.43, 0.77)	19.52	1.00 (0.76, 1.33)	1.82 (1.26, 2.63)
Third ^e	12.60	0.68 (0.48, 0.96)	11.68	1.05 (0.69, 1.58)	1.47 (0.91, 2.37)	8.64	0.54 (0.37, 0.79)	10.75	0.42 (0.29, 0.61)	0.86 (0.54, 1.37)
Highest ^f	12.55	0.83 (0.50, 1.38)	9.28	0.77 (0.45, 1.31)	0.91 (0.46, 1.81)	12.04	0.84 (0.43, 1.65)	8.07	0.39 (0.21, 0.74)	0.53 (0.22, 1.25)
Relative inequality index		0.63 (0.38, 1.04)		0.76 (0.45, 1.27)	1.18 (0.63, 2.19)		0.40 (0.23, 0.69)		0.27 (0.16, 0.46)	0.84 (0.44, 1.58)
South										
Educational level	13.36		13.03			13.98		15.09		
Basic ^c	16.33	1.00	22.17	1.00		17.82	1.00	25.61	1.00	
Secondary ^d	14.85	0.91 (0.69, 1.22)	15.01	0.74 (0.54, 1.03)	0.86 (0.57, 1.29)	12.54	0.77 (0.57, 1.04)	14.48	0.65 (0.49, 0.85)	0.90 (0.63, 1.29)
Third ^e	12.94	0.80 (0.55, 1.16)	12.82	0.73 (0.49, 1.09)	0.87 (0.55, 1.40)	15.23	0.56 (0.35, 0.88)	13.89	0.51 (0.35, 0.76)	0.93 (0.57, 1.53)
Highest ^f	13.48	0.89 (0.55, 1.45)	12.61	0.78 (0.46, 1.32)	0.78 (0.40, 1.50)	11.76	0.93 (0.55, 1.95)	7.74	0.46 (0.24, 0.89)	0.48 (0.17, 0.87)
Relative inequality index		0.80 (0.48, 1.33)		0.72 (0.42, 1.23)	0.81 (0.44, 1.52)		0.54 (0.30, 1.00)		0.35 (0.20, 0.62)	0.66 (0.35, 1.25)

Note. OR = odds ratio; CI = confidence interval.

^a Reported in the past 6 months and age standardized.

^b Adjusted by age, income quintile, and occupational status.

^c < 5 years of education.

^d 5 years of education.

^e 6–9 years of education.

^f ≥ 9 years of education.

care services.^{23–25} Previous literature found that education affected health inequalities via pathways of income and occupation.^{6,26} The fact that the education-related health inequalities remained significant after we controlled for income and occupation effects may indicate an independent effect of education on health, especially among women. One of the possible pathways for education to affect health is through health-related behaviors.

Following the literature on health-related behaviors,^{6,25,27} we analyzed education-related differences in lifestyles, such as smoking, drinking, and physical exercise, and in health care use (Table 2). Although higher educational levels generally correlate with less fre-

quent risky behavior (e.g., smoking, drinking), more frequent physical exercise, and higher health care use rate, the most striking finding was on the interaction of education, gender, and smoking behavior. We found that rural Chinese women had a significantly lower smoking rate than did men, consistent with other literature,²⁸ which may be related to the fact that Chinese women are more price-sensitive than men, quite contrary to the findings from the United States and other countries.^{29,30} Moreover, the gender difference could stem from broader differences in willingness to incur health risks.³¹

On the basis of our analysis, especially on smoking behavior, we speculate that one of

the possible reasons for the observed larger education-related health inequalities among women might be the stronger educational effect on healthy behaviors among women than among men. In the Chinese cultural context, especially in rural China, differential social roles and constraints still exist in women and men, a fact that might help modify the effect of education on healthy behaviors. For example, cessation rates, or interest in quitting smoking, are very low among Chinese men. According to the National Prevalence Study, only 2.3% of the respondents were former smokers, and only 9.4% of the current smokers were at some stage of trying to quit.²⁹ The recalcitrance of men to the notion of

TABLE 2—Differences in Lifestyles and Health Care Use, by Educational Level: Rural Areas of China, 1993 and 2001

Educational level	Smoking Prevalence, %				Alcohol Use Prevalence, %				Physical Exercise Prevalence, %				Nonhospitalization Prevalence, %			
	1993		2001		1993		2001		1993		2001		1993		2001	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
North																
Basic ^a	76.57	6.37	70.98	16.37	43.51	5.06	48.24	16.04	0.84	0.40	1.57	3.93	7.32	4.95	2.75	3.60
Secondary ^b	72.06	1.32	71.24	6.11	37.18	2.89	50.06	8.41	3.15	0.48	5.63	5.16	2.42	1.68	2.45	2.99
Third ^c	59.04	0.96	60.14	1.50	32.11	1.44	43.39	1.78	5.59	5.30	10.70	9.29	1.83	0.96	1.11	0.68
Highest ^d	62.45	0.00	52.55	2.11	28.27	0.83	42.68	2.11	11.81	11.57	22.29	17.89	0.42	0.00	0.96	1.05
South																
Basic ^a	78.52	11.67	68.60	4.93	37.78	4.64	50.51	7.25	1.85	0.58	1.71	2.17	2.59	1.90	5.12	4.20
Secondary ^b	71.87	3.28	69.87	2.36	28.96	2.60	51.58	7.33	1.86	1.13	8.32	6.83	0.93	0.79	1.76	1.49
Third ^c	55.85	1.15	50.37	0.76	25.42	0.38	38.52	3.67	4.91	4.22	15.56	12.69	0.56	0.96	0.99	1.68
Highest ^d	60.22	0.85	37.23	1.01	27.01	3.39	32.85	1.52	17.88	14.41	31.02	31.82	0.36	3.39	1.82	1.01

^a <5 years of education.

^b 5 years of education.

^c 6–9 years of education.

^d ≥9 years of education.

quitting has a cultural underpinning. For instance, gift giving among relatives, friends, and business partners is an important part of Chinese tradition. With some regional exceptions, cigarettes and liquor remain the 2 most popular gift items.

Because of data limitations, our results are indicative, not conclusive. Uncertainties remain in the causality of the education-related health inequalities and gender differences. It would be interesting for future studies not only to test the reproducibility of our results but also to examine pathways through which education helps women to modify their health determinants. Nonetheless, given the inherent values of education for women, as reflected in the Millennium Development Goals³² pertaining to education and gender equality, our results seem to highlight the instrumental values of improving education for women to reduce health inequalities and improve population health. ■

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Contributors

J. Wu and Y. Liu conceived the study and supervised all aspects of its implementation. Q. Sun and J. Qian assisted with the study and completed the analyses. K. Rao and Z. Li synthesized analyses and led the writing of the brief. All authors helped to conceptualize ideas, interpret findings, and review drafts of the brief.

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Human Participant Protection

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